

## CLAIMS

1. Portable radio frequency device comprising a power supply and a power control for  
5 controlling power provided to said device during a limited period so as to consume a  
correspondingly limited amount of power from said power supply,  
a synchronous oscillator (1b) powered by said power supply during said limited period,  
said synchronous oscillator coupled to  
10 an application (1cd; 1c; 1d) and to  
an antenna (1a),  
said device for providing an output signal (2e; 3) for carrying out said application during  
said limited period in response to an input signal (2; 3e) received by said device and amplified by  
said synchronous oscillator during said limited period.
- 15 2. The device of claim 1, wherein said antenna (2a) is for capturing an incoming radio  
frequency input signal (2) for providing a captured signal (2ac) coupled to said synchronous  
oscillator (2b) via a first part (2c) of said application (2cd) and wherein said synchronous oscillator  
is responsive to said captured signal coupled thereto for providing an intermediate signal (2bd) to  
20 a second part (2d) of said application (2cd) for providing said output signal (2e).
3. The device of claim 2, wherein said first part (2c) of said application (2cd) is an electrical  
node and the captured signal (2ac) is provided directly to said synchronous oscillator (2b) without  
conditioning by any said application (2cd).
- 25 4. The device of claim 2, wherein said first part (2c) of said application (2cd) conditions said  
captured signal (2ac) for providing a conditioned signal (2cb) to said synchronous oscillator (2b).
5. The device of claim 4, wherein said synchronous oscillator (2b) further conditions said  
conditioned signal (2cb) for providing said intermediate signal as a further conditioned signal  
30 (2bd) to said second part (2d) of said application.
6. The device of claim 2, wherein said second part (2d) of said application (2d) conditions  
said intermediate signal (2bd) from said synchronous oscillator (2b).
- 35 7. The device of claim 2, wherein said second part (2d) of said application is an electrical  
node and the intermediate signal (2bd) provided from said synchronous oscillator (2b) is the  
same as said output signal (2e) from the second part (2d) of said application (2cd).

8. The device of claim 2, wherein said synchronous oscillator (2b) comprises a plurality of synchronous oscillators connected in a series of stages.

9. The device of claim 2, wherein said synchronous oscillator (2b) includes means for heterodyning two or more signals.

10. The device of claim 9, wherein at least one of said two or more signals is externally injected and said means for heterodyning includes means for heterodyning said at least one of said two or more signals with a signal provided locally to one or more synchronous oscillators.

11. The device of claim 1, wherein said synchronous oscillator comprises a Colpitts oscillator.

12. The device of claim 1, further comprising:

a switch (1k, 2k, 3k, 36), responsive to a limited power supply (1f, 2f, 3f, Vcc) for providing power to said device in a closed position thereof; and

a switch control (1h, 2h, 3h, 38) for controlling said switch in said closed position for said providing power and in an open position for interrupting said power.

13. The device of claim 2, wherein said synchronous oscillator comprises plural synchronous oscillators connected in a series of stages, each stage adding a gain factor which altogether provide a total gain for said incoming radio frequency signal lockable at a frequency in a bandwidth range equal to an input bandwidth range within which a frequency of said incoming radio frequency signal is received by said device.

14. The device of claim 2, wherein said incoming radio frequency signal has an input frequency within a designated input bandwidth range, wherein said synchronous oscillator comprises a plurality of synchronous oscillators connected in a series of amplifying stages, wherein said output signal is provided for transmission as an outgoing radio frequency signal at a frequency lockable within said designated input bandwidth range.

15. The device of claim 1, wherein a first application part (3c) of said application is responsive to said input signal (3e) for providing a conditioned signal (3cb), wherein said synchronous oscillator (3b) is responsive to said conditioned signal (3cb) for providing an intermediate signal (3bd), wherein a second part (3d) of said application is responsive to said intermediate signal for coupling said intermediate signal to said antenna (3a) for providing an outgoing radio frequency signal (3).

16. The device of claim 15, wherein said second part (3d) of said application is an electrical node and the intermediate signal (3bd) from the synchronous oscillator (3b) is provided directly to said antenna (3a) without conditioning by said second part (3d) of said application.

17. The device of claim 15, wherein said second part (3d) of said application conditions said intermediate signal (3bd) for providing a conditioned signal (3da) to said antenna (3a) which in turn provides said outgoing radio frequency signal (3) for transmission.

18. The device of claim 15, wherein said first part (3c) of said application is an electrical node and the conditioned signal (3cb) from the first part (3c) of the application is the same as the input signal (3e) and is provided directly to said synchronous oscillator (3b) without any conditioning by said first part (3c) of said application.

19. The device of claim 15, wherein said first part (3c) of the application conditions said input signal (3e) for providing said conditioned signal (3cb) to said synchronous oscillator (3b).

20. The device of claim 15, wherein said first part (3c) of said application originates said conditioned signal (3cb) to said synchronous oscillator (3b).

21. The device of claim 15, wherein said synchronous oscillator (3b) includes means for heterodyning two or more signals.

22. The device of claim 21, wherein at least one of said two or more signals is externally injected and said means for heterodyning includes means for heterodyning said at least one of said two or more signals with a signal provided locally to one or more synchronous oscillators.

23. The device of claim 15, wherein said synchronous oscillator (3b) comprises a plurality of synchronous oscillators connected in a series of stages.

24. The device of claim 23, wherein each stage adds a gain factor which altogether provide a total gain for said radio frequency signal lockable at a frequency in a bandwidth range equal to an input bandwidth range within which a frequency of said incoming radio frequency signal is received by said device.

25. The device of claim 15, wherein said incoming radio frequency signal has an input frequency within a designated input bandwidth range, wherein said synchronous oscillator comprises a plurality of synchronous oscillators connected in a series of amplifying stages, wherein a reply frequency of said outgoing radio frequency signal is lockable within said designated input bandwidth range.

26. The device of claim 15 configured as a transponder by also using said antenna for receiving or by the addition of a receive antenna.

27. The device of claim 15, wherein said first application part (3c5) is a pressure sensor circuit for providing said conditioned signal as a pressure signal (3cb) having a frequency indicative of sensed pressure.

28. The device of claim 1 further comprising another antenna coupled to said application.

29. The device of claim 2, further comprising another antenna, responsive to said application output signal, for transmission as an outgoing radio frequency signal.

30. The device of claim 2, further comprising means responsive to said output signal (28da), for providing an outgoing radio frequency signal.

31. The device of claim 29, configured as a ranging device.

32. The device of claim 30, configured as a ranging device.

33. The device of claim 2, wherein said device is part of a quadrature modulator.

34. The device of claim 15, wherein said device is part of a quadrature modulator.

35. The device of claim 2, wherein said second part (2d6) comprises a detector for providing a voltage output.

36. The device of claim 2, wherein said second part (2d6) comprises a detector for providing an information signal output.

37. The device of claim 2, wherein said second part (2d5) of said application (2cd) comprises a detector and a switch control.

38. A transponder comprising:

a first antenna (28a) responsive to an incoming radio frequency signal (14) for providing a captured radio frequency signal (28ac);

5 a first application part (28c) responsive to said captured signal, for providing a first coupled signal (28cb);

a synchronous oscillator, responsive to said first coupled signal, for providing a conditioned output signal (28bd);

10 a second application part (28d) responsive to said conditioned output signal, for providing a second coupled signal (28da); and

a second antenna (30a), responsive to said second coupled signal (28da), for providing an outgoing radio frequency signal (12).

39. The transponder of claim 38, wherein said device comprises a shared antenna instead of said first antenna and said second antenna as separate antennas.

40. The transponder of claim 38, configured as a ranging device

41. A device, comprising:

20 a quadrature hybrid for providing a pair of quadrature signals in response to an input signal;

a pair of synchronous oscillators each responsive to a respective one of the quadrature signals for providing synchronous oscillator output signals; and

25 a summer, responsive to the output signals from the synchronous oscillators, for providing a summed output signal.

42. The device of claim 41, further comprising a power control for controlling power provided from a power supply to said device to a limited period.

30 43. The device of claim 41, further comprising at least one antenna coupled to said device.

44. The device of claim 43, wherein said device is a portable radio frequency device.

35 45. The device of claim 44, further comprising a power control for controlling power provided from a power supply to said device to a limited period.